



LAKE ONTARIO LAKELAKE MANAGEMENT PLAN UPDATE '03

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Lake Ontario Lakewide Management Plan - Working Together

Working through partnership was the focus of the work of the LaMP in 2002. New connections were made, and exciting new plans were drafted to help piece together the Lake Ontario puzzle.

Through a newly planned cooperative monitoring program we are working together to better understand ongoing sources of contamination and the effects of exotics on the lower foodweb. Some sampling will be done in partnership with the binational agency responsible for managing the fishery industry in Lake Ontario.

The LaMP has made an important link to the Great Lakes Binational Toxics Strategy. Our continued involvement with this initiative will help ensure our objectives for environmental protection are integrated.

The LaMP is also keeping a close watch on emerging issues for the lake, including the potential threat of botulism, and new contaminants called polybrominated-diphenyl ethers (PBDEs). This is just part of what you'll find in *Update 2003*.

Whether we are tracking down the source of pollutants, coordinating the monitoring of the lake

or tracking emerging issues, we're always working together with our partners to improve our Great Lake.



Researchers collect phytoplankton, zooplankton and water samples from Lake Ontario. Photo credit: Environment Canada.

What is the LaMP?

The Lake Ontario Lakewide Management Plan (LaMP) is a cooperative effort to restore and protect the health of Lake Ontario by reducing chemical pollutants entering the lake and addressing the needs of the fish and wildlife living in the watershed.

Building on the Lake Ontario Toxics Management Plan developed in 1987, Environment Canada, the United States Environmental Protection Agency, the Ontario Ministry of the Environment, and the New York State Department of Environmental Conservation have been working together to achieve the goals of the LaMP!

The Lake Ontario LaMP and LOC: Building Partnerships that Work!

Partnership is the key to restoring, protecting and conserving the Great Lakes. With the cooperation and collaboration of governments, organizations, citizens and industry on both sides of the border, we are making progress in understanding and protecting Lake Ontario.

The recently established partnership between the Lake Ontario LaMP and the Great Lakes Fishery Commission's Lake Ontario Committee (LOC) has led to increased information sharing and the development of common aquatic ecosystem goals and objectives to help track progress in restoring the Lake Ontario ecosystem. Where possible, the

LaMP and LOC are working together to manage changes occurring in the ecosystem.

The LAMP and LOC are conducting a 2003 cooperative monitoring project that includes intensive sampling of water, zooplankton and other aquatic organisms to better understand the impact that exotic species are having on the Lake Ontario ecosystem.

This year's State of Lake Ontario conference, held in March, is another example of the value of the LaMP and LOC partnership. Working with other government partners, such as Fisheries and

- **Tracking the Future of Lake Ontario: 2003 Intensive Sampling Year**
- **We Are Moving!**

Oceans Canada and the United States Environmental Protection Agency, the LOC and LaMP organized a conference of experts who shared information on existing conditions and emerging trends in Lake Ontario. Cooperative efforts such as this illustrate that partnership is indeed the key to protecting and conserving the Great Lakes!

The Great Lakes Fishery Commission was established in 1955 by the Canadian/U.S. Convention on Great Lakes Fisheries. The Commission coordinates fisheries research, controls the invasive sea lamprey and facilitates cooperative fishery management among the state, provincial, tribal, and federal management agencies.

The LOC has representatives from the New York State Department of Environmental Conservation (NYSDEC) and the Ontario Ministry of Natural Resources (OMNR), organizations with the authority over fish management issues in Lake Ontario. Their responsibilities include setting allowable catch limits, stocking fish and managing the recovery of native fish populations.

Each year the LOC and its partners conduct surveys using net trawls and other techniques to estimate populations of alewives, smelt, lamprey, lake trout and other fish. This information is carefully considered in making management decisions aimed at maintaining and where necessary, restoring a healthy fishery. The results of these studies are reported out each spring at the LOC's annual meeting. For more information, see <http://www.glfc.org/>.

Tracking the Future of Lake Ontario: 2003 Intensive Sampling Year

Lake Ontario is a vast and deep lake. Monitoring the status of this huge ecosystem with its hundreds of miles of shoreline and its water basins is a real challenge. The arrival of exotic species such as zebra mussels and predatory zooplankton has further complicated this task by altering the aquatic foodweb in ways we do not yet fully understand. We know that some of these changes have been very significant. For example, the small insect-like organism, *Diporeia*, once the dominant bottom dwelling organism, and an important food for fish, has nearly disappeared from nearshore waters. It is suspected that zebra mussels are able to out-compete *Diporeia* for food. There are concerns that the aquatic foodweb may no longer be able to support healthy populations of whitefish, lake trout and salmon, especially if other key native organisms are also lost.

The Lake Ontario LaMP and the Lake Ontario Committee are coordinating a number of 2003 monitoring efforts to help understand how these changes have altered the flow of nutrients and contaminants through the aquatic foodweb. Building on routine long-term programs and adding new components where needed, water, sediment, and lower foodweb organisms will be collected across the lake. This binational effort will promote improved communication and data sharing amongst monitoring programs and staff and will pull together key researchers to interpret the data and to effectively communicate the "big picture" to stakeholders. The 2003 year of intensive Lake Ontario sampling is the first step in developing a long-term binational monitoring strategy that meets the needs of both water quality and fishery managers.

We Are Moving!

The LaMP Web site is moving.

Information related to the Great Lakes and Lakewide Management Plans will be housed on one new Web site: www.binational.net.

In an effort to simplify things, Environment Canada and U.S. Environmental Protection Agency have set up a Web site that deals with binational programs. At this new site you will find such topics as the Lakewide Management Plans and Binational Remedial Action Plans as well as other binational programs that the two agencies participate in.

Remember to add www.binational.net to your list of favourites!



Web
Site

Lake Ontario Air Deposition Study (LOADS)

In 2002 the LaMP began a major cooperative monitoring project to study the levels of mercury, polychlorinated biphenyls (PCBs), dioxins, mirex and dichloro-diphenyl-dichloroethylene (DDE) that deposit from the air into the lake. These pollutants can affect the safety of eating fish caught in the lake.

As part of the Lake Ontario Air Deposition Study or LOADS, samples of air and water were taken from the Environmental Protection Agency (EPA) research vessel Lake Guardian during its April and September cruises.

Additional samples were collected at the land-based site at Sterling, NY. EPA scientists sampled tributaries and Environment Canada (EC) scientists took samples from the existing Toronto buoy and the Integrated Atmospheric Deposition Network monitoring station at Pt. Petre, Ontario. Results from the stationary sites will be correlated with those obtained on the Lake Guardian.

The study has three main objectives:

- It will estimate the contaminant loadings (derived from knowing the volume and concentration) being deposited from the air into the lake. This information will be plugged into the

Lake Ontario Mass Balance Model, a mathematical model that predicts what effect reducing pollution will have on the lake and its fish;

- It will assess any differences in concentrations and deposition over land and over water; and,
- It will examine the effect of urban areas on deposition to the lake.

The LaMP partners will continue sampling in the summer of 2003. Results of the effort will be synthesized to form a report on air deposition to the lake.



Canadian and U.S. researchers work together to collect air deposition samples. Photo credit: Bob Kelly, United States Environmental Protection Agency.

- **Lake Ontario Air Deposition Study (LOADS)**
- **Introducing the Great Lakes Human Health Network**

Introducing the Great Lakes Human Health Network

Information sharing is the focus of the newly-created Great Lakes Human Health Network.

Annex 2 of the Canada-U.S. Great Lakes Water Quality Agreement requires that Lakewide Management Plans (LaMPs) "include a definition of the threat to human health posed by critical contaminants". In order to facilitate better communication and information sharing between governments on human health issues directly related to Great Lakes water quality, a Great Lakes Human Health Network has been formed.

Working through the existing LaMP and RAP processes, the Network is intended to focus on ongoing and emerging human health issues in the Great Lakes basin. The Network is a voluntary partnership of federal, provincial, state and local health agencies, being supported by the U.S. Environmental Protection Agency and Health Canada.

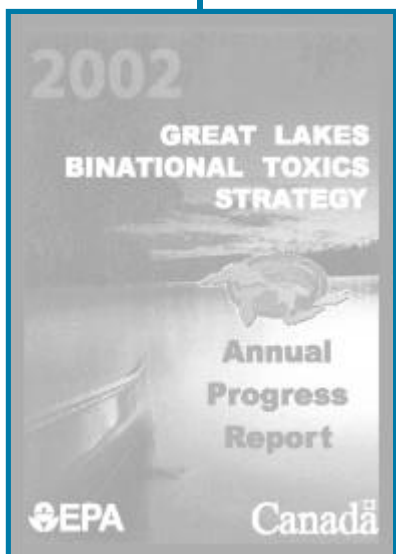
Initially each country will establish its own domestic network, with the goal of launching a binational network by the Fall of 2003.

- Great Lakes Binational Toxics Strategy
- Lake Ontario - St. Lawrence Water Level Study

Great Lakes Binational Toxics Strategy

Under the Great Lakes Binational Toxics Strategy (GLBTS), Canada and the U.S. are working together to eliminate potential sources of contamination to the Great Lakes. Some examples include:

- reducing home sources of dioxin and furan emissions through the "Burn It Smart Campaign";
- preventing mercury from going down the drain and into the lakes by encouraging "Household Hazardous Waste" collection events and recycling programs for thermostats, thermometers, fluorescent lamps and button batteries;
- reducing the threat of tire fires and the noxious fumes they produce by reducing tire piles through the "Tire Pile Campaign";
- recognizing municipalities and industries that have made extraordinary efforts to reduce and eliminate PCBs, going beyond compliance with the law; and,
- supporting the steel industry's efforts to monitor reductions in emissions of dioxins and furans, and preventing mercury from being introduced in scrap metal, to reduce emissions to the environment



The GLBTS, signed by Canada and the U.S. in 1997, represents the most comprehensive effort by the two countries to achieve virtual elimination of persistent toxic substances in the Great Lakes. Under the Strategy, Environment Canada and the U.S. Environmental Protection Agency work together with industries, municipalities, and environmental and community groups on both sides of the border to address substances targeted for virtual elimination. These substances include mercury, polychlorinated biphenyls (PCBs), dioxins and furans, dichloro-diphenyl-trichloroethane (DDT), and mirex, among others.

For more information, please visit <http://www.binational.net/bns/index-e.html>.

Lake Ontario - St. Lawrence Water Level Study

The International Lake Ontario-St. Lawrence River Study Board was established by the International Joint Commission (IJC) in December 2000 and is coordinating a five-year study to assess and evaluate the current rules for the water level regulation of Lake Ontario, and the outflow from Lake Ontario through to the St. Lawrence River.

The IJC formed the Study Board to evaluate the impacts of changing water levels on all affected interests, including environmental factors, shore erosion, flood damages, recreational boating and tourism. A binational team of experts from government, Native communities, academia and interest groups, has been assembled to examine the geographic, scientific, economic and community concerns within the Lake Ontario - St. Lawrence River system.

Extensive public consultation is a major component of the water level study, and is provided through a Public Interest Advisory Group (PIAG). After completion of the five-year Study, the Board will, based upon the results of the Study and consultations with the public, deliver recommendations to the IJC for possible amendments or additions to the present criteria and the recommended regulation plan to give effect to these criteria.

The Lake Ontario LaMP has been participating in the IJC study by attending round table discussions and sessions of both the Public Interest Advisory Group and the Environmental Technical Work Group to offer comments on how to include LaMP goals and objectives when considering the effects of changing water levels on the ecosystem of Lake Ontario.

For additional information on the water level study, go to www.losl.org. For additional information on the IJC, go to www.ijc.org.

The Boundary Waters Treaty, between Canada and the United States, established the **International Joint Commission** in 1909. This six person Commission has three members appointed by the President of the United States, with the advice and approval of the Senate, and three who are appointed by the Governor in Council of Canada, on the advice of the Prime Minister. The Commissioners must follow the Treaty and act impartially as they review problems, resolve disputes and decide on issues related to mutual boundary waters.

Studying Mink and Otter in the Lake Ontario Basin: Signs of a Recovering Ecosystem

Mink and river otter are making a comeback in the Lake Ontario basin. Their populations were severely reduced in the 1800s due to habitat loss, water pollution and excessive trapping. Prior to these changes the river otter had the largest geographic range of any North American mammal.



Mink are a good indicator of ecosystem health. Photo credit: USEPA, Great Lakes National Programs Office.

Mink live on a diet of fish, muskrats, mice and other small creatures, while otters consume fish almost entirely. Given the position of mink and otter - high in the foodweb - their health could be impacted if the fish they rely on are highly contaminated. The presence of sufficient quality and quantity of habitat is also essential to their successful reproduction and survival. These qualities make them a good indicator of Lake Ontario ecosystem health. While increasing populations would be a positive sign of a recovering ecosystem, decreasing populations would indicate a negative change in the biological, chemical or physical status of the ecosystem.

The secretive nature of these animals makes them difficult to study in the wild. American and Canadian trapping statistics have been the primary source of information on mink and otter. The LaMP, working closely with wildlife experts, collected these statistics and reviewed trapping records, sighting reports and other information to develop a basinwide picture of their distribution and relative abundance.

The review showed that more than 1200 river otters and 5000 mink were trapped during the 1999-2000 harvest season, providing good evidence that significant numbers of these animals are present in the basin. Mink are located throughout the basin and their populations are stable. River otter populations are increasing, expanding into areas where they have not been seen in decades.

River otter, found around the eastern end of Lake Ontario, in central Ontario and along the St. Lawrence River, are now moving into western and central New York as more and more abandoned agricultural land returns to natural conditions. Their expansion has been aided by initiatives like the New York River Otter project that released nearly 300 river otters at several locations in central and western New York.



River otter populations are increasing in the Lake Ontario basin. Photo courtesy New York State River Otter Project.

The LaMP will continue to work with its partners to protect habitat and water quality to ensure that mink and otter continue to call the Lake Ontario basin home.

For more information on efforts to restore river otter populations, see: www.nyotter.org/.

- **Studying Mink and Otter in the Lake Ontario Ecosystem: Signs of a Recovering Ecosystem**

- **Tracking Down PCBs in Lake Ontario Tributaries**
- **Remedial Action Plans**

Tracking Down PCBs in Lake Ontario Tributaries

Environment Canada and the Ontario Ministry of the Environment are looking into PCB pollution coming from tributaries to Lake Ontario. Project Trackdown, a Canadian federal/provincial pilot program under the Lake Ontario LaMP, is designed to develop ways to track down sources of PCBs in Lake Ontario tributaries. The project began in 2000 with the selection of three watersheds from around the Lake Ontario basin: Twelve Mile Creek, Etobicoke Creek and the Cataraqui River.

The project involves extensive sampling for PCBs in water, sediment, fish and caged mussels at various locations along the tributaries to

determine the sources of critical pollutants. The project will also try to determine whether sources of PCBs are historical or ongoing and locally controllable. Results will help determine the need for future measures and/or remediation actions that will ultimately reduce the amount of critical pollutants entering Lake Ontario.

Sampling for the projects continued in the summer and fall of 2002 and will resume in the spring of 2003. Analysis of data is ongoing. Environment Canada and the Ministry of the Environment are assessing the effectiveness of the initiative so that the experience gained can be applied to future contaminant trackdown projects.



Remedial Action Plans

In the LaMP 2004 Report, we will provide an update on the status of the Areas of Concern (AOCs) around Lake Ontario. For information about the AOCs, check out www.binational.net.

Emerging Issues

Botulism Alert for Lake Ontario

Concerns about a major outbreak of Type E botulism spreading into Lake Ontario continue, following the fourth straight year of high fish and waterbird mortality in Lake Erie. U.S. and Canadian natural resource scientists are keeping a close watch for diseased fish and waterbirds along Lake Ontario's shoreline.

Type E botulism can be harmful or even fatal to humans and other animals if they consume infected birds or fish. The botulism problem is of particular concern to the Lake Ontario LaMP because healthy populations of gulls, bald eagles and lake trout are key ecosystem indicators. During the summer and autumn of 2002, at least five dead gulls and four ducks found along New York's Lake Ontario shoreline were confirmed to have died from the toxin. It was unknown whether the birds had contracted the disease in Lake Ontario. A small number of dead gulls was reported found between Burlington and Niagara-on-the-Lake, but their death due to the botulism toxin could not be confirmed. Type E botulism has not been found in any fish from Lake Ontario. There have been no reports of any human illnesses associated with this outbreak.

In response to the Type E botulism outbreak, which has been occurring in Lakes Erie and Huron since 1999, the U.S. Environmental Protection Agency, Environment Canada, and the New York State Great Lakes Protection Fund have funded research projects to help understand the sources and conditions, exposure pathways, and possible predictive indicators of the toxin.

Any discovery of dead or dying water birds and fish showing clinical signs of botulism such as an inability to walk, fly or swim, should be reported to the New York State Department of Environmental Conservation or Ontario Ministry of Natural Resources officials immediately. For information on local offices see your phone book or check the Web site in the United States at www.dec.state.ny.us/ or in Canada at www.mnr.gov.on.ca/MNR/.



A researcher collects birds that likely died from an outbreak of botulism type E in Lake Erie. Photo credit: Jeff Robinson, Environment Canada.

PBDEs - An Emerging Chemical of Concern

Concentrations of polybrominated-diphenyl ethers (PBDEs) in the Great Lakes system are increasing dramatically. Based on levels detected in lake trout and herring gull eggs from Lake Ontario, it appears that local emissions from large urban/industrial areas are the major sources. However, this problem is not confined to Lake Ontario - PBDEs are found throughout the world.

PBDEs are chemicals that are added to plastics (such as those used in televisions, computer monitors, textiles and plastic foams) in order to make them fire resistant.

As an emerging issue, PBDEs have not been well studied to date. For example, there are currently no water quality or fish tissue criteria for PBDEs. There is also no definite information known about their effects on humans. Human health studies are now being conducted by scientists on both sides of the border. Work is also underway to better understand how PBDEs move around in the foodweb.

• Emerging Issues

- **Next Steps**
- **Lake Ontario LaMP Public Meeting**
- **For More Information**

Next Steps

The Four Parties will continue efforts to restore and protect Lake Ontario and its biological resources. The LaMPworkplan is a fundamental component in maintaining progress for this goal. A new LaMPworkplan became effective in January 2003 and is based on a 5 year schedule.

In the upcoming years, special attention will be concentrated on the following activities:

- Coordination of binational monitoring efforts and programs to better assess the health of Lake Ontario and its ecosystem.
- Reporting on the status of adopted ecosystem indicators, habitat, source trackdown and invasive species.
- Broadening partnerships with other scientific groups to share data, conduct analyses, and assist with peer review.
- Promoting public outreach on pollution prevention, LaMP activities and partnering opportunities.

We are looking forward to this next phase of progress for Lake Ontario and its ecosystem. We invite you to view our new workplan and relevant documents on our Web site at www.binational.net.

Lake Ontario LaMP Public Meeting

The annual joint public meeting of the Lake Ontario LaMP and the Niagara River Toxics Management Plan (NRTMP) is scheduled to be held in Niagara Falls, Ontario on June 10, 2003.

These meetings are held every year as a means of reporting to the public on the progress of the Lake Ontario LaMP and the NRTMP. This year the focus will be on the Niagara River Toxics Management Plan with a brief presentation on the status of the Lake Ontario LaMP. Next year, at the meeting to be held in Niagara Falls, New York, the emphasis will shift to the Lake Ontario Lakewide Management Plan.

This is your opportunity to come and meet the people responsible for the LaMP. After the presentation there will be an opportunity for you to ask questions or raise your concerns.

The meeting will be held from 7:00-9:30 PM at the Hilton Niagara Falls, 6361 Fallsview Blvd., Niagara Falls, Ontario.

If you would like to receive more information about the meeting and are not on our mailing list, please contact one of the names below.

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